

Date: Sun, 21 Mar 93 00:42:24 PST  
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>  
Errors-To: Info-Hams-Errors@UCSD.Edu  
Reply-To: Info-Hams@UCSD.Edu  
Precedence: Bulk  
Subject: Info-Hams Digest V93 #355  
To: Info-Hams

Info-Hams Digest Sun, 21 Mar 93 Volume 93 : Issue 355

## Today's Topics:

\* SpaceNews 22-Mar-93 \*  
AMSAT Bulletins 20-Mar-93  
eophysical Data Broadcast for 20 March  
d Memory Effect-Fact or Myth?  
PACE BULLETIN 008 ARLS008

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>  
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 20 Mar 93 17:32:00 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: \* SpaceNews 22-Mar-93 \*  
To: info-hams@ucsd.edu

SB NEWS @ AMSAT \$SPC0322  
\* SpaceNews 22-Mar-93 \*

BID: \$SPC0322

SpaceNews

MONDAY MARCH 22, 1993

SpaceNews originates at KD2BD in Wall Township, New Jersey, USA. It is published every week and is made available for unlimited distribution.

\* STS-55 SAREX LAUNCH! \*

=====

With only a few days before launch, the SAREX team is preparing for what promises to be the first of several SAREX flights planned for 1993.

The STS-55 Space Shuttle Columbia mission is currently scheduled to be launched into a 28.5 degree orbit on Sunday March 21 at 14:52 UTC. A 2.5 hour launch window is planned. The STS-55 mission, designated SL-D2 (Spacelab Deutsche-2), represents the second in a series of dedicated flights for Germany. The primary goals of the mission are to perform studies in materials and life science research. A 9 day flight is planned.

The seven person crew on STS-55 includes ham radio operators Steve Nagel, N5RAW, Jerry Ross, N5SCW, Charlie Precourt, KB5YSQ, Hans Schlegel, DG1KIH and Ulrich Walter, DG1KIM. SAREX operations planned on this flight includes 2-meter voice and packet. The primary voice callsign will be N5RAW. The packet radio callsign is W5RRR-1.

The 2-meter FM voice and packet downlinks for the SAREX station are on 145.550 MHz.

Uplinks are:	Voice	Packet
Europe	144.80 MHz 144.75 MHz 144.70 MHz	144.49 MHz
Rest of World	144.99 MHz 144.97 MHz 144.95 MHz 144.93 MHz 144.91 MHz	144.49 MHz

Note: The crew will not favor any specific voice uplink frequency, so your ability to communicate with SAREX will be the "luck of the draw."

For all operations, Earth stations should listen to the downlink frequency and transmit only when the Shuttle is in range and the astronauts are on the air. Listen for any instructions from the astronauts as to specific uplink frequencies in use during the current pass. Also, listen to the uplink frequencies before transmitting to avoid interference to other users.

In addition to the U.S. SAREX ham gear in the Shuttle mid-deck, an

additional ham radio station will be flown in the German spacelab module. This station, designated SAFEX (for Spacelab Amateurfunk-Experiment), includes a 2-meter FM downlink and a 70-cm FM uplink capability. A dual band (2-meter/70-cm) external antenna, mounted on the German spacelab module, will be used for SAFEX contacts. Payload Specialists Schlegel and Walter expect to make a few scheduled contacts with European schools with this equipment.

The externally mounted SAFEX antenna gives the SAREX team an opportunity to compare the performance of the U.S. SAREX window mounted antenna to an externally mounted antenna. A special A/B antenna test is planned on orbits 61 and 62 using the normal SAREX downlink frequency, 145.550 MHz. During orbit 61 the crew will transmit using the SAREX window antenna and on orbit 62 the crew will use the SAFEX external antenna. Individuals in the Southeastern U.S. are welcome to help participate in this test by taking signal strength readings of the received signal for both orbit passes. If the shuttle is well above your horizon (>10 degrees) for both passes, see page 42 of the February, 1993 QST to learn more details.

The following represents the prelaunch Keplerian Element Set as generated by Gil Carman, WA5NOM.

STS-55

1 00055U	93080.67000478	.00120200	00000-0	36300-3	0	49
2 00055	28.4697	233.5969	0003812	314.2100	45.8202	15.90487610

Satellite: STS-55

Catalog number: 00055

Epoch time: 93080.67000478 =====> (21 MAR 93 16:04:48.41 UTC)

Element set: JSC-004

Inclination: 28.4697 deg

RA of node: 233.5969 deg Space Shuttle Flight STS-55

Eccentricity: .0003812 Prelaunch Keplerian Elements

Arg of perigee: 314.2100 deg Launch: 21 MAR 93 14:52 UTC

Mean anomaly: 45.8202 deg

Mean motion: 15.90487610 rev/day G. L. Carman

Decay rate: 1.2020e-03 rev/day\*2 NASA Johnson Space Center

Epoch rev: 2

[Submitted by Frank H. Bauer, KA3HDO, AMSAT V.P. for Manned Space Programs]

\* OSCAR DOUBLE-HOP TEST \*

=====

Double-hop Test 28 March  
using RS14/A021 Mode B to RS10 Mode A

At approximately 2150 UTC on 28 March, a transatlantic double-hop

opportunity will exist for stations in the northeastern part of North America, transmitting via RS14/A021 Mode B and listening on RS-10 Mode A. The RS3A command station will have RS14/A021 in Mode B, Transponder 2, from 1700 to 2400 on that day.

A group of UK stations organized by G0NKA and G4CUO will transmit to North America beginning at 2150 UTC, as indicated below. North American stations wishing to try should transmit before 2150, using an uplink between 435.100 and 435.110 MHz, LSB or CW. Try to pick an uplink frequency not being used by other stations.

North American stations please report your results (UK stations heard/worked plus particulars) via packet to W2RS @ WA2SNA.NJ.USA.NA or via Internet to w2rs@amsat.org. UK stations please report results to G0NKA @ GB7DTX.GBR.EU.

Here is some additional information prepared by G0NKA:

CHECKLIST:

Set shack clock to GMT accurate to within 1 second.

Set uplink frequency for RS14 to a spot between 435.100 and 435.110, LSB or CW. To remain fixed throughout.

If all OK then GO. Slottime = 0 min 05 sec. (21:49:51 to 21:49:56)

TCA between RS10 and RS14 occurs at 21:49:51

	DATE	AOS	LOS	LAT	LON	DURATION	
RS-10/11	03/28/1993	21:40:29	21:49:56	41.4n	042.1w	00:09:27	SOUTHWRD
RS-14	03/28/1993	21:49:51	22:05:01	35.8n	036.4w	00:15:10	NORTHWRD

SEPARATION = 921kms Approx.

U/Link = 435.105 MHz

X/Link = 145.880 MHz +/- Doppler

D/Link = 29.374 MHz +/- Doppler

On this last pass it will not be possible to work both satellites at TCAsat. However it looks possible for USA stations to TX prior to 21:49:51 using RS-14, and to be RXed in UK from RS-10. Then from 21:49:51 reverse the procedure. Also the TCA given above is not the true TCAsat, because at True TCAsat only one satellite is in range of the UK.

We suggest US stations TX " CQ DOHOP de xxxxx " pre 21:50 GMT, we listen.  
UK stations TX " CQ DOHOP de xxxxx " post 21:50 GMT, you listen.

Reports in both directions to include RST + RX freq AT TIME, via packet if possible for speed, to G0NKA @ GB7DTX.GBR.EU.

CW	SSB				
Callsigns UK = G4CUO, G4ZHG, G3CAG	G6HMS, G7MUB, G4CUO, G4ZHG, G3CAG				
TX Freq.	Station	Mode	TX Freq.	Station	Mode
=====	=====	=====	=====	=====	=====
435.108 MHz	G7MUB	LSB	435.103 MHz	G4CUO	CW
435.105 MHz	G6HMS	LSB	435.102 MHz	G4ZHG	CW
			435.101 MHz	G3CAG	CW
			435.100 MHz	G3IOR	CW

If we receive signals from US then we will vary our return to include where possible the callsigns of stations heard, ie. " Wxxxx Kxxxx Dohop de Gxxxx ".

[Info via Ray Soifer, W2RS]

\* FEEDBACK/INPUT WELCOMED \*

=====
 Mail to SpaceNews should be directed to the editor (John, KD2BD) via any of the following paths:

FAX : 1-908-747-7107  
 UUCP : ...catfish.ocpt.ccur.com!ka2qhd!kd2bd  
 PACKET : KD2BD @ NN2Z.NJ.USA.NA  
 INTERNET : kd2bd@ka2qhd.ocpt.ccur.com -or- kd2bd@amsat.org

MAIL : John A. Magliacane, KD2BD  
 Department of Engineering and Technology  
 Advanced Technology Center  
 Brookdale Community College  
 Lincroft, New Jersey 07738  
 U.S.A.

<<-- SpaceNews: The first amateur newsletter read in space! -->

/EX

--  
 John A. Magliacane, KD2BD \* /\ \ \* Voice : 1-908-224-2948  
 Advanced Technology Center |/\|/\| Packet : KD2BD @ NN2Z.NJ.USA.NA  
 Brookdale Community College |/\|/\| Internet: kd2bd@ka2qhd.ocpt.ccur.com  
 Lincroft, NJ 07738 \* /\ \ \* Morse : -.- .-. .... -... -..

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Date: 21 Mar 93 01:09:38 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: AMSAT Bulletins 20-Mar-93  
To: info-hams@ucsd.edu

SB SAT @ AMSAT \$ANS-079.01  
AMSAT-NA OPERATIONS NET SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 079.01 FROM KD2BD  
WALL TOWNSHIP, NJ MARCH 20, 1993  
BID: \$ANS-079.01  
TO ALL RADIO AMATEURS BT

AMSAT-NA Operations Net Schedule

AMSAT Operations Nets are planned for the following times. Mode B nets are conducted on A0-13 on a downlink frequency of 145.950 and Mode J/L on a downlink of 435.970.

Date	UTC	Mode	Phs	NCS	Alt
28-Mar-93	0100	B	51	WJ9F	VE2LVC
03-Apr-93	2130	B	150	VE2LVC	W90DI
10-Apr-93	2230	B	86	N7NQM	W5IU

Any stations with information on current events would be most welcome. In the unlikely event that either the NCS or the alternate do not call on frequency, any participant is invited to act as net control.

\*\*\*\*\*

Slow Scan Television on Oscar 13

SSTV sessions will be held on UTC Saturdays and Sundays:  
Mode J downlink 435.980  
Mode B after J downlink 145.960

OPSNETS will take priority, look for sstv activity immediately after the net. SSTVer's are invited to join the net to make schedules at other times if desired.

[The AMSAT News Service would like to thank Dave Guimont for this news item.]

/EX

SB SAT @ AMSAT \$ANS-079.02  
STS-55 LAUNCH DELAY

HR AMSAT NEWS SERVICE BULLETIN 079.02 FROM KD2BD  
WALL TOWNSHIP, NJ MARCH 20, 1993  
BID: \$ANS-079.02  
TO ALL RADIO AMATEURS BT

The STS-55 launch has been delayed until Monday, March 22.  
The following elements, valid for an on-time launch at 14:51 UTC,  
were provided by Gil Carman, WA5NOM.

STS-55  
1 00055U 93 81.66931033 .00120200 00000-0 36300-3 0 50  
2 00055 28.4697 234.3316 0003812 314.2100 45.8202 15.90487610 29

Satellite: STS-55  
Catalog number: 00055  
Epoch time: 93081.66931033 =====> (22 MAR 93 16:03:48.41 UTC)  
Element set: JSC-005  
Inclination: 28.4697 deg  
RA of node: 234.3316 deg Space Shuttle Flight STS-55  
Eccentricity: .0003812 Prelaunch Keplerian Elements  
Arg of perigee: 314.2100 deg Launch: 22 MAR 93 14:51 UTC  
Mean anomaly: 45.8202 deg  
Mean motion: 15.90487610 rev/day G. L. Carman  
Decay rate: 1.2020e-03 rev/day\*2 NASA Johnson Space Center  
Epoch rev: 2

[Submitted by Frank Bauer, KA3HDO for the SAREX Working Group]

/EX  
SB SAT @ AMSAT \$ANS-079.03  
STS-55 SAREX DETAILS

HR AMSAT NEWS SERVICE BULLETIN 079.03 FROM KD2BD  
WALL TOWNSHIP, NJ MARCH 20, 1993  
BID: \$ANS-079.03  
TO ALL RADIO AMATEURS BT

With only a few days before launch, the SAREX team is preparing for what promises to be the first of several SAREX flights planned for 1993.

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The seven person crew on STS-55 includes ham radio operators Steve Nagel, N5RAW, Jerry Ross, N5SCW, Charlie Precourt, KB5YSQ, Hans Schlegel, DG1KIH and Ulrich Walter, DG1KIM. SAREX operations planned on this flight includes 2-meter voice and packet. The primary voice callsign will be N5RAW. The packet radio callsign is W5RRR-1.

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Uplinks are:	Voice	Packet
Europe	144.80 MHz 144.75 MHz 144.70 MHz	144.49 MHz
Rest of World	144.99 MHz 144.97 MHz 144.95 MHz 144.93 MHz 144.91 MHz	144.49 MHz

Note: The crew will not favor any specific voice uplink frequency, so your ability to communicate with SAREX will be the "luck of the draw."

For all operations, Earth stations should listen to the downlink frequency and transmit only when the Shuttle is in range and the astronauts are on the air. Listen for any instructions from the astronauts as to specific uplink frequencies in use during the current pass. Also, listen to the uplink frequencies before transmitting to avoid interference to other users.

In addition to the U.S. SAREX ham gear in the Shuttle mid-deck, an additional ham radio station will be flown in the German spacelab module. This station, designated SAFEX (for Spacelab Amateurfunk-Experiment), includes a 2-meter FM downlink and a 70-cm FM uplink capability. A dual band (2-meter/70-cm) external antenna, mounted on the German spacelab module, will be used for SAFEX contacts. Payload Specialists Schlegel and Walter expect to make a few scheduled contacts with European schools with this equipment.

The externally mounted SAFEX antenna gives the SAREX team an opportunity to compare the performance of the U.S. SAREX window mounted antenna to an externally mounted antenna. A special A/B antenna test is planned on orbits 61 and 62 using the normal SAREX downlink frequency, 145.550 MHz. During orbit 61 the crew will transmit using the SAREX window antenna and on orbit 62 the crew will use the SAFEX external antenna. Individuals in the Southeastern U.S. are welcome to help participate in this test by taking signal strength readings of the received signal for both orbit passes.

If the shuttle is well above your horizon (>10 degrees) for both passes, see page 42 of the February, 1993 QST to learn more details.

[Submitted by Frank H. Bauer, KA3HDO, AMSAT V.P. for Manned Space Programs]

/EX

SB SAT @ AMSAT \$ANS-079.04

ZRO TEST SCHEDULE

HR AMSAT NEWS SERVICE BULLETIN 079.04 FROM KD2BD

WALL TOWNSHIP, NJ MARCH 20, 1993

BID: \$ANS-079.04

TO ALL RADIO AMATEURS BT

The ZRO Memorial Technical Achievement Award Program, or just "ZRO Test" has a new schedule for March, April and May, 1993, via AMSAT-OSCAR-13. This activity is a test of operating skill and equipment performance.

During a typical ZRO run, a control station will send numeric code groups using CW at 10 words-per-minute. At the beginning of the run, uplink power from the control station is set to match the general beacon downlink strength. This is level "zero". The control operator will send and repeat a random five-digit number, then lower his uplink power by 3 dB (half power) and repeat the procedure with a new random number. This will continue to a level 27 dB below the beacon (level "nine").

A participating listener monitors the downlink signals till he can no longer copy the numbers. Those who can hear the beacon will qualify for the basic award by copying the code group heard at level "zero". The challenge is to improve home-station performance to a point where the lower-level downlink signals can be copied (levels 6 through 9).

The following schedule of Mode "B" and "JL" ZRO tests were chosen for convenient operating times and favorable squint angles. The "B" tests can be heard on 145.840 MHz and the "JL" tests on 435.945 MHz. Ed N5EM will run the "JL" tests while Andy WA5ZIB will continue with "B" runs.

Saturday Mar. 20, 1993 at 0210 UTC "JL"
Saturday Mar. 20, 1993 at 2330 UTC "B"
Monday Mar. 29, 1993 at 0340 UTC "JL"
Saturday Apr. 3, 1993 at 1930 UTC "B"
Monday Apr. 19, 1993 at 0310 UTC "JL"
Saturday Apr. 24, 1993 at 1900 UTC "B"
Saturday May 1, 1993 at 0115 UTC "JL"
Saturday May 1, 1993 at 2245 UTC "B"

Note that the dates and days are shown in "UTC", thus all the "JL" tests

occur in the late evening hours for those in North America. For example, the March 20th UTC "JL" test is at 9:10 PM EST Friday night (the 19th). Any changes will be announced as soon as possible via the AMSAT HF and A0-13 Operations Nets.

Recently updated ZRO brochures are available from WA5ZIB, Andy MacAllister, AMSAT V.P. User Operations, 14714 Knightsway Drive, Houston, TX 77083 for an S.A.S.E. with two units of postage. The brochure characterizes test procedures, means for obtaining certificates and gives some historical background about the program. New brochures were not made for tests conducted in October, November and December, 1992. Those with S.A.S.E.'s on file will get a copy of the new brochure.

All listener reports with date of test and numbers copied should be sent to WA5ZIB at the address above. A report will be returned verifying the level of accurate reception.

[The AMSAT News Setvice would like to thank Andy MacAllister, WA5ZIB for this bulletin item.]

/EX  
SB SAT @ AMSAT \$ANS-079.05  
DOUBLE-HOP TEST 28-MAR-93

HR AMSAT NEWS SERVICE BULLETIN 079.05 FROM KD2BD  
WALL TOWNSHIP, NJ MARCH 20, 1993  
BID: \$ANS-079.05  
TO ALL RADIO AMATEURS BT

Double-hop Test 28 March  
using RS14/A021 Mode B to RS10 Mode A

At approximately 2150 UTC on 28 March, a transatlantic double-hop opportunity will exist for stations in the northeastern part of North America, transmitting via RS14/A021 Mode B and listening on RS-10 Mode A. The RS3A command station will have RS14/A021 in Mode B, Transponder 2, from 1700 to 2400 on that day.

A group of UK stations organized by G0NKA and G4CUO will transmit to North America beginning at 2150 UTC, as indicated below. North American stations wishing to try should transmit before 2150, using an uplink between 435.100 and 435.110 MHz, LSB or CW. Try to pick an uplink frequency not being used by other stations.

North American stations please report your results (UK stations heard/worked plus particulars) via packet to W2RS @ WA2SNA.NJ.USA.NA or via Internet to w2rs@amsat.org. UK stations please report results to G0NKA @ GB7DTX.GBR.EU.

Here is some additional information prepared by G0NKA:

CHECKLIST:

Set shack clock to GMT accurate to within 1 second.

Set uplink frequency for RS14 to a spot between 435.100 and 435.110, LSB or CW. To remain fixed throughout.

If all OK then GO. Slottime = 0 min 05 sec. (21:49:51 to 21:49:56)

TCA between RS10 and RS14 occurs at 21:49:51

	DATE	AOS	LOS	LAT	LON	DURATION	
RS-10/11	03/28/1993	21:40:29	21:49:56	41.4n	042.1w	00:09:27	SOUTHWRD
RS-14	03/28/1993	21:49:51	22:05:01	35.8n	036.4w	00:15:10	NORTHWRD

SEPARATION = 921kms Approx.

U/Link = 435.105 MHz

X/Link = 145.880 MHz +/- Doppler

D/Link = 29.374 MHz +/- Doppler

On this last pass it will not be possible to work both satellites at TCAsat. However it looks possible for USA stations to TX prior to 21:49:51 using RS-14, and to be RXed in UK from RS-10. Then from 21:49:51 reverse the procedure. Also the TCA given above is not the true TCAsat, because at True TCAsat only one satellite is in range of the UK.

We suggest US stations TX " CQ DOHOP de xxxxx " pre 21:50 GMT, we listen.

UK stations TX " CQ DOHOP de xxxxx " post 21:50 GMT, you listen.

Reports in both directions to include RST + RX freq AT TIME, via packet if possible for speed, to G0NKA @ GB7DTX.GBR.EU.

CW			SSB		
Callsigns UK = G4CU0, G4ZHG, G3CAG			G6HMS, G7MUB, G4CU0, G4ZHG, G3CAG		
TX Freq.	Station	Mode	TX Freq.	Station	Mode
=====	=====	====	=====	=====	====
435.108 MHz	G7MUB	LSB	435.103 MHz	G4CU0	CW
435.105 MHz	G6HMS	LSB	435.102 MHz	G4ZHG	CW
			435.101 MHz	G3CAG	CW
			435.100 MHz	G3IOR	CW

If we receive signals from US then we will vary our return to include where possible the callsigns of stations heard, ie. " Wxxxx Kxxxx Dohop de Gxxxx ".

[The AMSAT News Service would like to thank Ray Soifer, W2RS for this bulletin item.]

/EX

SB SAT @ AMSAT \$ANS-079.06  
RS-10 OPERATING NOTES

HR AMSAT NEWS SERVICE BULLETIN 079.06 FROM KD2BD  
WALL TOWNSHIP, NJ MARCH 20, 1993  
BID: \$ANS-079.06  
TO ALL RADIO AMATEURS BT

Two goals of all satellite operators are to use in-orbit resources efficiently and to avoid interference to other users. These operating notes for the RS-10 Mode A transponder were prepared in order to aid all users in achieving these objectives.

There is a transponder band plan in effect for RS-10. According to "The RS Satellites Operating Guide" by G. Gould Smith WA4SXM (published by AMSAT-NA), the downlink should be used as follows:

29.357 Beacon  
29.360 Passband lower limit  
\* CW \*  
29.380 Passband center  
\* USB \*  
29.400 Passband upper limit  
29.403 Beacon

Please use the appropriate portion of the passband to avoid interfering with users of the other mode.

Since the 2-meter Mode A uplink is at a higher frequency than the 10-meter downlink, RS-10 users should keep downlink frequency fixed and vary uplink frequency to compensate for Doppler shift. The equation for determining uplink frequency for this non-inverting transponder is

uplink = - translation constant + downlink - Doppler

using the convention that Doppler shift is positive during approach and negative during departure. The value for the translation constant is given in "The Satellite Experimenter's Handbook" by Martin Davidoff K2UBC (published by the ARRL) as -116.500 MHz. Recently, WD8LAQ noticed that his uplink was several kHz higher than what he had calculated using the published constant. By experimentation, N3KVQ determined that the translation constant is more accurately -116.5048 MHz. While the difference in values may seem small, searching for one's downlink 4.8 kHz in the wrong place will cause one to completely miss a CW

or USB signal. It is not clear if the translation constant was simply reported to the nearest 0.5 MHz or if the on-orbit environment has changed some components in the transponder.

When searching for one's signals, send a few dits (CW) or speak your callsign (USB). Holding down the key or whistling uses a great deal of satellite transponder power and completely disrupts QSOs; these full-amplitude signals also inflict severe pain upon the ears of those unfortunate enough to be listening to that particular frequency. Tuning with callsigns is also operationally efficient in that stations engaged in a QSO know that another station is tuned up and ready to answer a call as soon as the contact ends.

The high amount of Doppler shift for this low Earth orbit satellite is certainly an operational challenge. If one QSO is conducted properly and a nearby second QSO is not, the second QSO can drift into the first one. The appropriate method is to choose a downlink frequency, tune the uplink frequency to correspond to that downlink frequency, then gradually increase the uplink frequency to compensate for Doppler shift through the pass. For a typical RS-10 pass (horizon of 10 degrees, maximum elevation of 40 degrees), the Doppler shift is approximately 3.7 kHz at the beginning of the pass.

Many RS-10 users seem to avoid the top 10 kHz of the passband to prevent QSOs from sliding out of the transponder due to Doppler shift. Detailed calculations show that if the appropriate procedure is followed, a QSO slides only about 1 kHz in the transponder itself. While the total Doppler shift experienced on the ground is almost 8 kHz, the frequency compensation technique greatly reduces the shift at the transponder. For example, QSOs begun with a 29.399 MHz downlink will not slide out of the passband. There is 40 kHz total bandwidth, so please spread out and use all of it.

Attempting to manage the uplink equation with a rapidly changing Doppler shift during a pass is usually too complicated to be done in real time. An alternative is presented here in the form of a table. Simply tune the downlink to the desired frequency and leave it there, then look up the appropriate uplink frequency from the table. The AOS column gives the uplink at Acquisition Of Signal; the TCA column gives the uplink at Time of Closest Approach. Doppler shift has been incorporated into the AOS column in an average sense for a typical pass (10 degrees horizon for the receiving station, 40 degrees maximum elevation for the pass). The table should be within 1 kHz of the proper frequency. With practice, the use of this table allows a user to avoid swooping through the passband in search of his signals. Once a user finds his downlink at AOS, it is a simple task to increase uplink frequency with every transmission to keep the QSO properly tuned.

## RS-10 UPLINK FREQ TABLE

DWNLNK	-----UPLINK-----	
	AOS	TCA
29.380	145.8815	145.8848
29.382	145.8835	145.8868
29.384	145.8855	145.8888
29.386	145.8875	145.8908
29.388	145.8895	145.8928
29.390	145.8915	145.8948
29.392	145.8935	145.8968
29.394	145.8955	145.8988
29.396	145.8975	145.9008
29.398	145.8995	145.9028

Several AMSAT members in the Washington, DC area (WD8LAQ, N3MZC, N3JON, KA1LM, KA2TPK, N3KTU) contributed to the preparation of these notes as a result of discussions that began during the weekly local AMSAT net. Comments, observations, and suggestions should be directed to Walter Daniel N3KVQ at KA3RFE.MD.USA.NA (packet), n3kvq@amsat.org (Internet), or his callbook address.

/EX

--  
John A. Magliacane, KD2BD \* /\\*\ \* Voice : 1-908-224-2948  
Advanced Technology Center |/\|/\| Packet : KD2BD @ NN2Z.NJ.USA.NA  
Brookdale Community College |/\|/\| Internet: kd2bd@ka2qhd.ocpt.ccur.com  
Lincroft, NJ 07738 \* /\\*\ \* Morse : -.- ... .---- -... -..

-----  
Date: 21 Mar 93 05:31:23 GMT  
From: news-mail-gateway@ucsd.edu  
Subject: Daily Solar Geophysical Data Broadcast for 20 March  
To: info-hams@ucsd.edu

!!BEGIN!! (1.0) S.T.D. Solar Geophysical Data Broadcast for DAY 079, 03/20/93  
10.7 FLUX=128.0 90-AVG=134 SSN=084 BKI=1433 3412 BAI=014  
BGND-XRAY=B2.6 FLU1=7.4E+05 FLU10=1.9E+04 PKI=3444 4321 PAI=018  
BOU-DEV=008,064,039,031,022,047,008,010 DEV-AVG=028 NT SWF=01:025  
XRAY-MAX= M1.8 @ 0106UT XRAY-MIN= B4.3 @ 2235UT XRAY-AVG= C2.1  
NEUTN-MAX= +004% @ 2115UT NEUTN-MIN= +000% @ 2345UT NEUTN-AVG= +1.7%  
PCA-MAX= +0.1DB @ 1550UT PCA-MIN= -0.2DB @ 2215UT PCA-AVG= -0.0DB  
BOUTF-MAX=55419NT @ 0513UT BOUTF-MIN=55374NT @ 1747UT BOUTF-AVG=55397NT  
GOES7-MAX=P:+111NT@ 2005UT GOES7-MIN=N:-057NT@ 1125UT G7-AVG=+074,+048,+008

```
GOES6-MAX=P:+127NT@ 1704UT    GOES6-MIN=N:-141NT@ 0454UT   G6-AVG=+091,-004,-057
FLUXFCST=STD:130,125,120;SESC:130,125,120 BAI/PAI-FCST=020,020,010/030,030,015
KFCST=4434 5344 4414 5422 27DAY-AP=018,008 27DAY-KP=2234 4433 2322 2322
WARNINGS=*MAJFLR;*SWF
ALERTS==MINFLR:M1.8/1N@0106UTC,N18W37(7448),II=2,IV=2;**245STRM:0942-1007;
**TENFLR:000SFU@1209UTC,DUR=11MIN;**SWEEP:II=3@1649-1658UTC
!!END-DATA!!
```

NOTE: The Effective Sunspot Number for 19 MAR 93 was 72.0.

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Date: Sun, 21 Mar 1993 02:30:02 GMT  
From: nwnexus!ole!ssc!tad@uunet.uu.net  
Subject: Nicad Memory Effect-Fact or Myth?  
To: info-hams@ucsd.edu

Do the performance of NiCad batteries suffer when they are repeatedly only slightly discharged? The story goes that one should do a deep discharge every time, before doing a complete charge. Otherwise after a number of shallow charge-discharge cycles the battery cannot do a deep discharge anymore.

Some years ago I read a letter in the Technical Correspondence column in QST from a couple of engineers at Gould saying that this was a myth, and that the nicad memory effect could only be demonstrated in the lab when the battery is repeatedly discharged many times to precisely the same level.

Last year QST magazine ran an article on nicads that mentioned the memory effect, and said that it was a myth, or at least vastly overstated.

I can't seem to find any research that supports either conclusion. The nicad memory belief seems to be quite popular, but none of the proponents that I have talked to can ever point me to any substantial source for data.

Anyone know the answer?

--  
Tad Cook | Phone: 206-527-4089 (home) | MCI Mail: 3288544  
Seattle, WA | Packet: KT7H @ N7DUO.WA.USA.NA | 3288544@mcimail.com  
| Internet: tad@ssc.com or...sumax!ole!ssc!tad

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Date: Sun, 21 Mar 93 02:50:40 GMT  
From: sdd.hp.com!zaphod.mps.ohio-state.edu!mstar!n8emr!bulletin@network.UCSD.EDU  
Subject: SPACE BULLETIN 008 ARLS008  
To: info-hams@ucsd.edu

=====|  
| Automatic relayed from packet radio via |  
| N8EMR's Ham BBS, 614-895-2553 |  
=====|

ZCZC AS87  
QST DE W1AW  
SPACE BULLETIN 008 ARLS008  
FROM ARRL HEADQUARTERS NEWINGTON, CT  
MARCH 19, 1993  
RELAYED BY KB8NW/OBS & BARF-80 BBS  
TO ALL RADIO AMATEURS

SB SPACE ARL ARLS008  
ARLS008 STS-55 UPDATE

STS-55 SPACE SHUTTLE COLUMBIA IS SCHEDULED FOR LAUNCH ON MONDAY,  
MARCH 22 AT 14:51 UTC. THIS WILL BE A 9 DAY MISSION. CREW MEMBERS  
INCLUDE STEVE NAGEL, N5RAW, JERRY ROSS, N5SCW, CHARLIE PRECOURT,  
KB5YSQ, HANS SCHLEGEL, DG1KIH AND ULRICH WALTER, DG1KIM. SAREX  
OPERATIONS TAKE PLACE ON 2-METER VOICE AND PACKET. PRIMARY VOICE  
CALLSIGN WILL BE N5RAW. PACKET RADIO CALLSIGN IS W5RRR-1.

THE 2-METER FM VOICE AND PACKET DOWNLINKS FOR THE SAREX STATION ARE  
ON 145.55 MHZ. SEE PAGE 42 FEBRUARY 1993 QST FOR DETAILS.

UPLINKS ARE:	VOICE	PACKET
EUROPE	144.80 144.75 144.70	144.49
REST OF WORLD	144.99 144.97 144.95 144.93 144.91	144.49

NOTE: THE CREW WILL NOT FAVOR ANY SPECIFIC VOICE UPLINK FREQUENCY.  
YOUR ABILITY TO COMMUNICATE WITH SAREX WILL BE THE LUCK OF THE DRAW.  
EARTH STATIONS SHOULD LISTEN TO THE DOWNLINK FREQUENCY AND TRANSMIT  
ONLY WHEN THE SHUTTLE IS IN RANGE. LISTEN FOR ANY INSTRUCTIONS FROM  
THE ASTRONAUTS AS TO UPLINK FREQUENCIES IN USE DURING THE CURRENT

PASS. ALSO, LISTEN TO THE UPLINK FREQUENCIES BEFORE TRANSMITTING TO AVOID INTERFERENCE TO OTHER USERS.

SCHLEGEL AND WALTER WILL MAKE CONTACTS WITH EUROPEAN SCHOOLS USING AN ADDITIONAL HAM RADIO STATION DESIGNATED SAFEX (SPACELAB AMATEURFUNK EXPERIMENT) IN THE GERMAN SPACELAB MODULE. WE CAN COMPARE THE PERFORMANCE OF THE US SAREX WINDOW MOUNTED INTERNAL ANTENNA TO THE SAFEX ANTENNA MOUNTED EXTERNALLY ON THE SPACELAB MODULE IN THE PAYLOAD BAY. AN OFFICIAL ANTENNA TEST IS PLANNED FOR ORBITS 61 AND 62. THE CREW WILL TRANSMIT ON 145.55 MHZ USING THE SAREX ANTENNA ON ORBIT 61 AND THE SAFEX ANTENNA ON ORBIT 62. HAMS IN SOUTHEASTERN USA CAN TAKE SIGNAL STRENGTH READINGS OF THE RECEIVED SIGNAL FOR BOTH PASSES. TO FIGURE TIMES FOR THE ORBITS, ADD 3 DAYS 18 HOURS 3 MINUTES TO LAUNCH TIME FOR ORBIT 61 AND 3 DAYS 19 HOURS 37 MINUTES FOR ORBIT 62. LISTEN TO W1AW AFTER THE LAUNCH FOR EXACT TIME OF LIFTOFF.

THE FOLLOWING IS THE PRELAUNCH KEPLERIAN ELEMENT SET GENERATED BY GIL CARMAN, WA5NOM.

STS-55

1 00055U	93080.67000478	.00120200	00000-0	36300-3	0	49	
2 00055	28.4697	233.5969	0003812	314.2100	45.8202	15.90487610	24

SATELLITE: STS-55

CATALOG NUMBER: 00055

EPOCH TIME: 93080.67000478 = (21 MAR 93 16:04:48.41 UTC)

ELEMENT SET: JSC-004

INCLINATION: 28.4697 DEG

RA OF NODE: 233.5969 DEG SPACE SHUTTLE FLIGHT STS-55

ECCENTRICITY: .0003812 PRELAUNCH KEPLERIAN ELEMENTS

ARG OF PERIGEE: 314.2100 DEG LAUNCH: 21 MAR 93 14:52 UTC

MEAN ANOMALY: 45.8202 DEG

MEAN MOTION: 15.90487610 REV/DAY G. L. CARMAN

DECAY RATE: 1.2020E-03 REV/DAY SQ NASA JOHNSON SPACE CENTER

EPOCH REV: 2

NNNN

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End of Info-Hams Digest V93 #355

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